SKF MARLIN Inspection Systems

Easy-to-use technology designed to increase productivity, safety and efficiency

The SKF MARLIN family of hand-held mobile computers combines ease of use with advanced technologies that automate inspection processes in virtually any type of facility.

SKF MARLIN I-Pro Non-NI, Class 1, Div 2

SKF MARLIN S-Pro ATEX Zone 1

SKF Wireless Machine Condition Detector

SKF Machine Condition Detector

Operator Driven Reliability

SKF MARLIN data managers are the frontline tools for operators in an Operator Driven Reliability (ODR) program. These rugged, high-performance devices replace verbal or paper inspection trails by documenting inspections with accurate, consistent and actionable information.

In an ODR program, operators are enabled by automated technologies to record observations of machine performance, process parameter inspections and critical machine conditions. The MARLIN system prompts corrective action when observed conditions deviate from established parameters, often preventing a more serious problem.

Flexible and customizable – an essential tool

The MARLIN system is not restricted to the manufacturing environment and can handle statistical process control, scheduling, environmental, Occupational Safety and Health Association (OSHA) inspections and other regulatory or internal company requirements. MARLIN is an essential tool for safety officers, security personnel and other staff members responsible for a wide range of inspection procedures.

SKF @ptitude Inspector software communicates enterprise-wide

The SKF @ptitude Inspector software completes the system, allowing for more in-depth analysis and communication between operations, maintenance, engineering and plant management. Implementing an ODR program using SKF MARLIN data managers and Inspector software can improve reliability, safety and communication with the plant-wide team.

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SKF MARLIN data manager

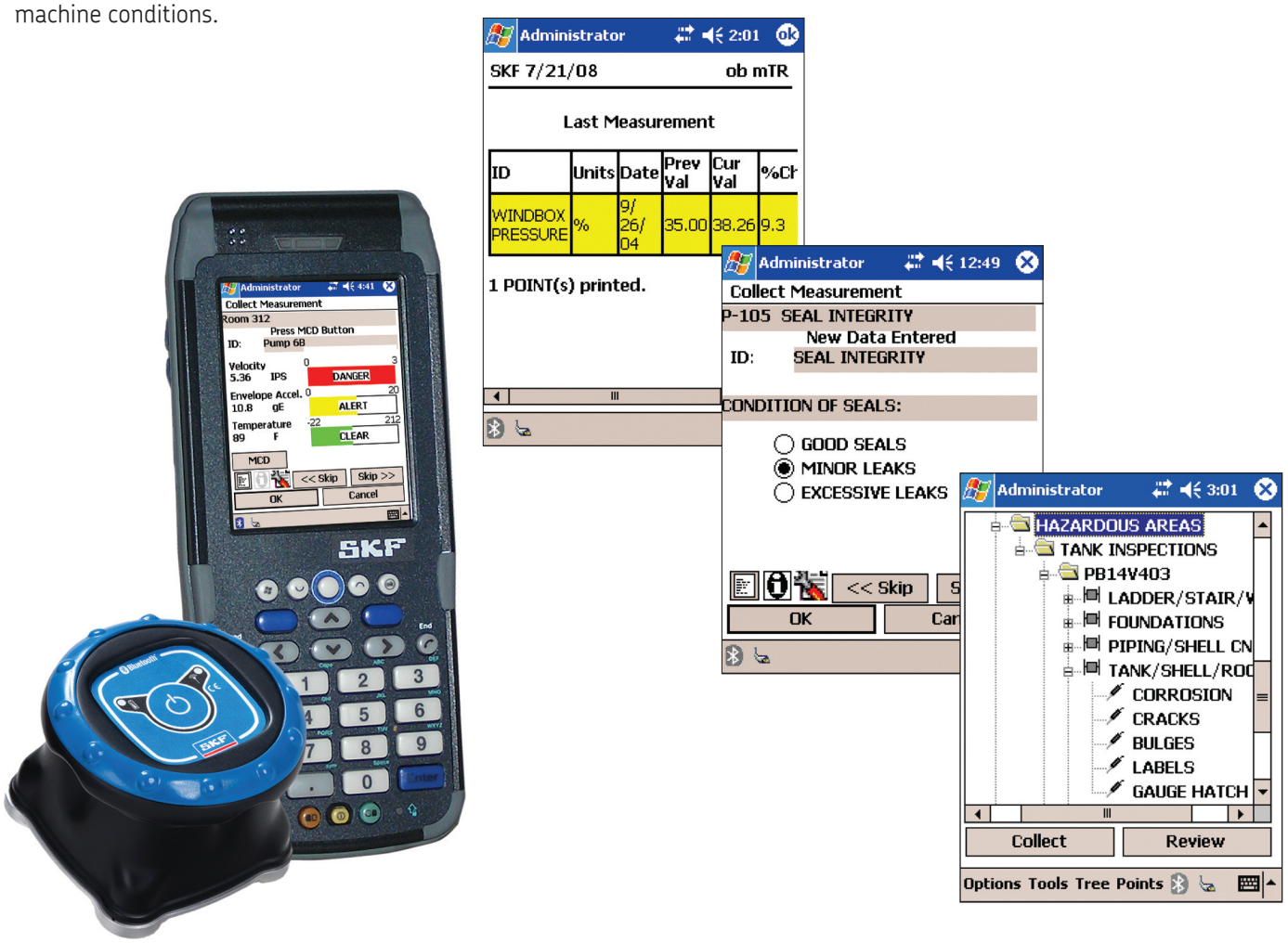
Flexible, enabling technology to meet every inspection need

The hand-held MARLIN computers offer advanced technology and ergonomic design that enhance effectiveness while easing the process of routine inspections.

The MARLIN data managers allow users to quickly and easily collect, store and analyze overall machine vibration, process and inspection data. Intuitive screens provide clear problem description and define and prioritize corrections according to preset parameters. Instructions are available at the push of a button to guide the user on the most appropriate response to take for changes in machine conditions.

MARLIN key features include:

- Drop tested, dust-tight and water resistant, the MARLIN is designed to withstand the most hostile industrial environments
- Barcode identification, Radio Frequency Identification (RFID), Bluetooth and Radio 802.11 b/g enabled functionality
- Models are available for use in hazardous areas requiring NI Class 1, Div 2 and ATEX Zone 1 certification
- Work notification system sets priorities, provides descriptions and defines required corrective actions
- Easy to recognize displays and touch screen or keypad data entry enhances proficiency with minimal training



SKF MARLIN I-Pro CMDM 6500 series, available in NI Class 1, Div 2 and Non-NI certifications, can be used with the SKF Wireless Machine Condition Detector.

Designed with the user in mind

MARLIN graphical-user interface (GUI) and high-resolution, backlit display make the data manager easy to operate – and viewable even in the darkest locations. The MARLIN is ergonomically designed to be held for long periods of time with a high capacity battery for full-shift power and maximum user productivity.

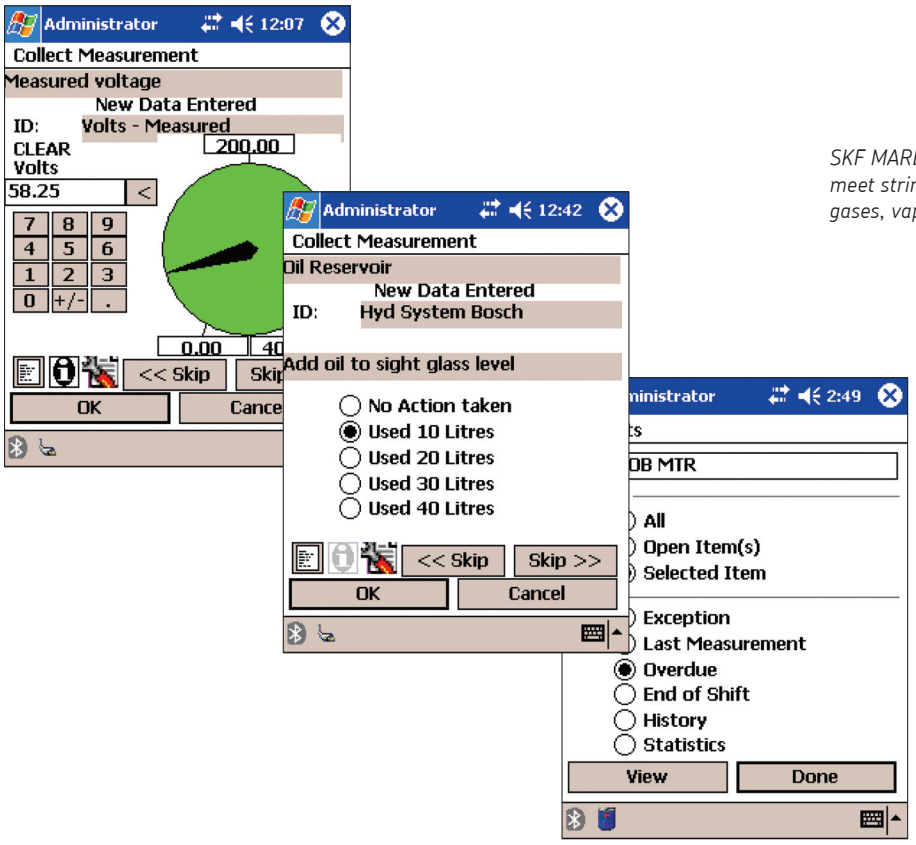
Selectable operator preferences save significant amounts of time by pre-selecting data collection methods as barcode only, smart stud only or both barcode and smart stud. Rounds are easily set up for speed of data collection and critical machine and process data can be communicated enterprise-wide to enable fast responses that keep production running at optimal speed.

Consistent data collection and reporting

Standardized notes can be used to document machinery and process conditions, allowing an operator to immediately record detailed observations of troublesome machine conditions or questionable measurements. Notes can be combined with machine data and images to create a variety of reports.

The MARLIN is available with a range of accessories to facilitate temperature, velocity and enveloped acceleration (vibration) readings.

SKF MARLIN S-Pro CMDM 5360 is ATEX Zone 1 certified to meet stringent safety requirements for use around flammable gases, vapors, liquids, dust or fibers.



Complete the System

The SKF @ptitude Inspector software completes the system, allowing for more in-depth analysis and the communication of machine condition between operations, maintenance, engineering and plant management. @ptitude Inspector incorporates a simple user interface to speed up system implementation. Easily create and modify databases in a hierarchical form, define data collection points and types, create routes; then download to the MARLIN data manager.

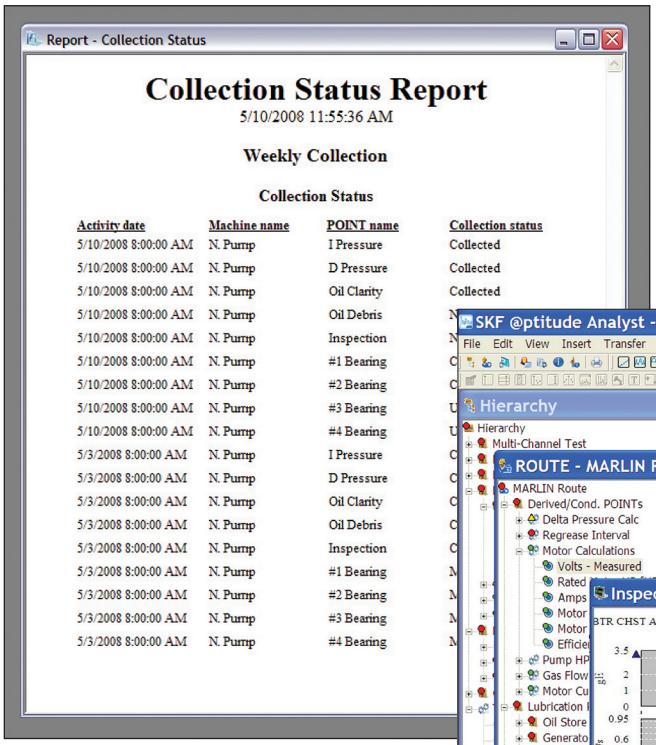
SKF @ptitude Inspector

Compliance reporting and scheduling allows a range of collection schedules that vary from day, week, month, day of year, and multiple or repeat collections per time period. Reports identify missed or overdue collection points or data collection that is out of compliance parameters.

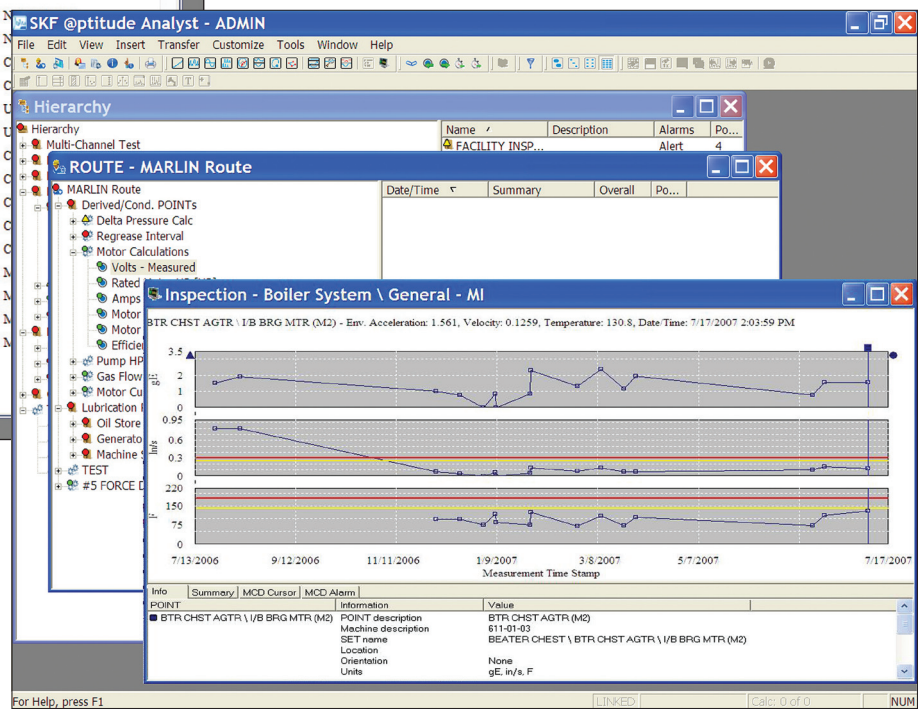
A variety of user specified views includes multi-pane plots, window sizes and positions, a customizable tool bar and more to enable optimum user productivity and efficiency.

Standardized notes can be used to document observed machinery and process conditions, then combine these conditions with machine data and images to create a variety of reports.

When used with SKF @ptitude Work Notification, work orders that may have previously been ignored are easily generated by machine operators as soon as they identify potential problem conditions.



Reports identity collection points missed, overdue, or out of compliance parameters to keep management informed.



Combining SKF MARLIN and @ptitude Inspector software means expert analysis for efficient decision making.

Software that is feature rich and easy to use

SKF @ptitude Inspector features and capabilities

Global settings

- System
  - English or metric
  - Operator ID
  - Date and time format
  - Password protected (four levels)

Data display

- Multiple Hierarchy
  - Manage Multiple Hierarchies from one hierarchy view (My Hierarchies)
  - Generate reports from Multiple Hierarchies as the source
  - Up/download Routes from Multiple Hierarchies
- Machine Node Priority Coloring
- Overall trend displays (single, overlay)
- Inspection
- Machine Condition Detector
- Wireless Machine Condition Detector

General

- User preferences allow customized look and feel
  - System, measurement communication, colors and plot settings
- Context sensitive help
- Complete user manual on installation DVD (Adobe Acrobat PDF format)
- Basic Product Support Plan
- On-site product installation and training services available

Reports

- Preserved reports – enables you to maintain a history of reports
- Shared reports – allows you to share and preconfigure reports for selected users
- Send reports to screen, HTML file, printer
- HTML file can be posted to internet/intranet and emailed
- HTML files can be opened and modified further using Microsoft Office products, i.e. Word, Excel and Powerpoint
- Customizable report content
- Data plots, supplemental information and digital images can be included in reports
- Report types
  - Last measurement
  - Exception
  - Overdue / non-compliant
  - Pending overdue / non-compliant
  - Collection status
  - Route history
  - Route statistics
  - Set statistics
  - Upload statistics
  - History
  - Inspection
  - Work notification
  - Blank (user defined)
  - Compliance
- Report templates allow quick and easy report configuration for use and reuse

Measurements

- Derived point – utilizes a user definable mathematical formula to calculate a derived value from data collected for multiple points. The result of this calculation is used for automatically inserting a value into the identified derived point. This enables easier and more efficient calculation of process related performance measurements.
- Conditional points
- English or metric units
- Volts (AC or DC)
- Temperature: °C and °F
- Pressure (PSI)
- Flow (GPM, LPM)
- Bars
- Speed
- Units per minute
- Inspection points (User defined)
  - Single
  - Multiple (up to five)
- MCD
  - Enveloped acceleration
  - Velocity
  - Temperature

Alarms

- Alarm view
  - Acknowledge alarms and enter comments or recommendations
  - Quickly find and identify all points in alarm within the hierarchy, group, route, workspace or machine
- Alarm Details
  - Provides a summary of type of alarm and status
- View alarm status indicators directly at the hierarchy
- User defined alarm database
  - Public alarms that can be shared with other users
  - Private alarms that can only be used by specific users
  - Unlimited number of alarms available
- Four overall alarm levels per measurement point
  - Danger high, alert high, alert low, danger low
  - Out of window, in window, level alarms supported
- Alarm types
  - Overall alarm
  - Inspection
  - MCD

Enhanced alarming

- User defined alarm database
  - Public alarms that can be shared with other users
  - Private alarms that can only be used by specific users
- Unlimited number of alarms available
- Four (4) overall alarm levels per measurement point
  - Danger high, alert high, alert low, danger low

SKF @ptitude Inspector is a key module in a family of reliability software applications that work together as @ptitude Monitoring Suite.

- Alarm types
  - Overall alarm
  - Inspection
  - MCD

Communication

- Microsoft ActiveSync (USB)
- Automatic report generation based on a specified time, data upload via scheduler wizard
- Download by Hierarchy, Route or Workspace
- Optional CMMS interface for Work Notification
- OPC client interface available

Security

- Fully configurable user rights that allow you to read, view and have full access
- Unlimited access levels
- Allows assignment of access rights to user groups
- Hierarchy access – an enhanced security feature that authorizes viewing and manipulation of hierarchies.

Templates and wizards

- Overall statistical alarm wizards uses historical data to help refine overall alarms
- Hierarchy template wizard allows for rapid hierarchy creation and machine templates for reuse
- Report template allows for the custom configuration of reports and report templates for reuse
- Scheduler wizard helps configure and preset recurring activities such as report generation, data archival and task reminders

Expanding your capabilities with MARLIN-compatible accessories

SKF Wireless Machine Condition Detector (WMCD)

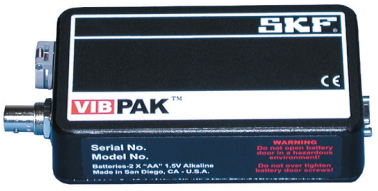
The Wireless Machine Condition Detector is a Bluetooth-enabled wireless device that captures and transmits temperature, velocity and enveloped acceleration (vibration) readings to the MARLIN handheld computer. The vibration data that is collected will enable problem detection at low, mid and high frequency ranges. The MARLIN will utilize the WMCD's readings to alert the user when normal limits have been exceeded. The WMCD combines safety and functionality in a powerful, flexible platform. Eliminating cabling also means increased safety and simplified reliability. **CMVL 8000-K**

SKF Machine Condition Detector (MCD)

The Machine Condition Detector is a lightweight handheld analysis tool that captures and displays temperature, velocity and enveloped acceleration (vibration) and alarms. The vibration data that is collected will enable problem detection at low, mid and high frequency ranges. The MCD automatically compares collected data with preset baselines and alerts the user when normal limits are exceeded. **CMVL 3600-IS**

SKF VibPak

The compact, lightweight device combines with MARLIN Inspection Systems to make it easy and convenient to check vibration data (velocity and enveloped acceleration) from accelerometers that are difficult or hard-to-reach locations. **CMVL 3700**



SKF MARLIN QuickConnect (MQC) Stud

The MARLIN QuickConnect Stud helps ensure proper sensor location and orientation for accurate and dependable vibration data collection. When equipped with a memory chip and temperature sensor, the sensor provides measurement point identification and point-specific alarm limits. **CMSS 26XX**

SKF Infrared Thermometer

The SKF Infrared Thermometer with laser sighting is a portable non-contact thermometer. MARLIN-compatible, the instrument is easy to use and designed for demanding environments. **CMAC 4220**

For comprehensive information on the MARLIN compatible accessories, including RFID Interrogators/Readers, batteries, chargers and tags, contact your SKF representative or visit our website: www.skf.com/cm.

Specifications

Physical characteristics

Dimensions

Length:

MARLIN I-Pro: 196 mm (7.7 in)

MARLIN S-Pro: 234 mm (9.20 in)

Width:

MARLIN I-Pro: 81 mm (3.2 in)

MARLIN S-Pro: 91 mm (3.60 in)

Depth:

MARLIN I-Pro: 28 mm (1.25 in)

MARLIN S-Pro: 43 mm (1.70 in)

Weight:

MARLIN I-Pro: 510–567 g (18–20 oz)

MARLIN S-Pro: 616–700 g (22–25 oz), configuration dependent

Environmental

Operating temperature range:

MARLIN I-Pro: –20 to +60 °C (–4 to +140 °F), application dependent

MARLIN S-Pro: –20 to +40 °C (–4 to +104 °F)

Storage temperature range:

MARLIN I-Pro: –20 to +70 °C (–4 to +158 °F)

MARLIN S-Pro: –25 to +70 °C (–13 to +158 °F)

Relative humidity:

5 to 95 % (non-condensing)

Environment sealing/rain and dust resistance:

MARLIN I-Pro: IP 64 compliant

MARLIN S-Pro: IP 54 compliant

Drop specification:

MARLIN I-Pro: 1,8 m (6 ft) MIL-STD 810

MARLIN S-Pro: multiple drops to concrete 1,8 m (6 ft)

Power

Battery type:

MARLIN I-Pro: Lithium ion, 3.7 v (4000 mAh cells), customer replaceable

MARLIN S-Pro: Lithium ion, 7.4 v (2200 mAh cells), customer replaceable

Battery capacity:

MARLIN I-Pro: 14.8 watt-hours

MARLIN S-Pro: 15.8 watt-hours

Communications

Standard communication:

MARLIN I-Pro: USB

MARLIN S-Pro: Serial Cable, USB

Wireless communication:

Bluetooth, Radio 802.11

Performance characteristics

Operating system:

MARLIN I-Pro: Microsoft Windows Mobile 2005

MARLIN S-Pro: Microsoft Windows Mobile 2003

Microprocessor:

MARLIN I-Pro: Intel XScale PXA270 Processor, 520 MHz

MARLIN S-Pro: Intel XScale PXA255 Processor, 400 MHz

Memory and storage

RAM memory:

MARLIN I-Pro: 128 MB

MARLIN S-Pro: 64 MB

Internal slots:

MARLIN I-Pro: Customer accessible miniSD slot for removable memory card up to 2 GB

MARLIN S-Pro: Secure Digital (SD), CompactFlash (CF) Type II

Display:

MARLIN I-Pro: Transflective TFT-LCD Backlight 89 mm (3.5 in), 240 pixels x 320 pixels, 64K

MARLIN S-Pro: Transflective daylight readable color display, 240 pixels x 320 pixels, 97 mm (3.8 in) diagonal

Regulatory approvals

Electrical safety:

MARLIN I-Pro: cULus Listed, GS, CCC, Gost (pending), NOM, HKSI
EMC: FCC Part 15B – Class B, ICES-003 Class B, EN 55022 Class B, EN 55024, EN 301 489-17, AS/ZNS 3548, GB9254-1998, BSMI, ICASA

MARLIN S-Pro: Certified to UL60950, CSA C22.2 No. 60950, EN60950/IEC 950

Laser safety:

MARLIN I-Pro: IEC 60825-1 / EN 60825-1 – Class 1 LED Product

MARLIN S-Pro: IEC Class 2/FDA Class II in accordance with IEC60825-1/EN60825-1

Hazardous area ratings

MARLIN I-Pro: Non-NI (CMDM 6510) NI Class I, Div 2, Groups A, B, C, and D

Class II, Div 2, Groups F and G, Class III T4 (CMDM 6520)

MARLIN S-Pro: ATEX, Zone 1 Ⓔx II 2 G EEx q [ib] IIC T4 (CMDM 5360)

SKF MARLIN Inspection Systems –
Easy-to-use technology to increase productivity, safety and efficiency

Ordering information
All MARLIN Kits are available in the following languages: English, German, French, Portuguese, Spanish, Swedish, Finnish, Russian, Traditional Chinese and Korean.

MARLIN I-Pro kits
CMDM 6510 Non-NI Phone keypad
CMDM 6520 NI Class 1 Div 2 Phone keypad
CMDM 6521 NI Class 1 Div 2 Alpha keypad

Each MARLIN I-Pro kit contains:
- MARLIN I-Pro data manager
- MARLIN application
- User manual (CD)
- Communication/recharging dock
- Lithium ion battery
- USB communication cable (Dock to PC) *USB Comms only
- Belt holster, tethered stylus

MARLIN S-Pro kits
CMDM 5360 ATEX Zone 1

Each MARLIN S-Pro kit contains:
- MARLIN S-Pro data manager
- MARLIN application
- User manual (CD)
- Communication / recharging dock with extra battery slot
- Lithium ion battery
- Serial communication cable (Dock to PC)
- USB communication cable (Dock to PC)

MARLIN accessories
Communications
- MARLIN I-Pro to MCD Pro IS or VibPak cable (CMAC 6141) requires CMAC 6142 adapter
- MARLIN I-Pro and S-Pro USB Cable for dock to PC (CMAC 6104)
- MARLIN S-Pro to MCD cable (CMAC 6109) requires CMAC 6115 adapter
- MARLIN S-Pro serial communication cable, dock to PC (CMAC 6116)

Battery and power
- MARLIN I-Pro Lithium ion battery (CMAC 6134)
- MARLIN I-Pro Communication / single recharging dock (CMAC 6136)
- MARLIN S-Pro Lithium ion battery 7.4 volts (CMAC 6117)
- MARLIN S-Pro Communication / re-charging dock with extra battery slot (CMAC 6110)

MQC (MARLIN QuickConnect) and mounting
- MARLIN Quick Connect: Mechanical M8 x 1.25 mounting thread – three (3) studs per package (CMSS 2600-3)
- MARLIN Quick Connect: Mechanical 1/4 x 28 mounting thread – three (3) studs per package (CMSS 2610-3)
- MARLIN Quick Connect: Computerized M8 x 1.25 mounting thread – three (3) studs per package (CMSS 2601-3)
- MARLIN Quick Connect: Computerized 1/4 x 28 mounting thread – three (3) studs per package (CMSS 2611-3)
- Tool Kit for Spot Face 1/4-28 (CMAC 9600-01)
- Tool Kit for Spot Face M8 x 1.25 (CMAC 9600-02)
- Drill Bit for 1/4-28 Kit (CMAC 9600-03)
- Tap for 1/4-28 Kit (CMAC 9600-04)
- Pilot for 1/4-28 Kit (CMAC 9600-05)
- Drill Bit for M8 x 1.25 Kit (CMAC 9600- 06)
- Tap for M8 x 1.25 Kit (CMAC 9600-07)
- Pilot for M8 x 1.25 Kit (CMAC 9600-08)
- End Mill or Counter Bore for either kit (CMAC 9600-09)

Miscellaneous
- MARLIN I-Pro belt holster (CMAC 6140)
- MARLIN I-Pro Tethered Stylus, five (5) pack (CMAC 6138)
- MARLIN I-Pro Screen Protectors, five (5) pack (CMAC 6139)

Power cords
- Contact your local SKF Sales Representative for any replacement cords.

Product Support Plans (PSP)
A range of Product Support Plans are available to protect your investment. Contact your local SKF Reliability Systems Sales Representative for additional information.

For additional information on SKF Reliability Systems products, contact:

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Web Site: www.skf.com/cm

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